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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,007	03/06/2002	Anthony F. Aiello	112056-0037	7581

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EXAMINER	
MCCARTHY, CHRISTOPHER S	

ART UNIT	PAPER NUMBER
2113	

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/092,007	AIELLO ET AL.	
	Examiner	Art Unit	
	Christopher S. McCarthy	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1-3*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Cheng et al. U.S. Patent 6,802,021.

As per claim 1, Cheng teaches a method for performing an input/output operation to a storage device from a computer, the storage device having one or more data paths to the computer (column 4, lines 15-24), the method comprising the steps of: selecting a first data path from a set of data paths to the storage device (column 2, lines 35-51); attempting the input/output operation using the selected first data path; selecting, in response to an error in the input/output operation using the first data path, a next data path from the linked list of data paths; and attempting the input/output operation using the selected next data path (column 9, lines 11-15).

As per claim 2, Cheng teaches the method of claim 1 wherein the set of data paths is dynamically generated in response to storage device events (column 5, lines 25-45; column 6, lines 15-21).

As per claim 3, Cheng teaches the method of claim 2 wherein the storage device event further comprises a Fibre Channel loop initialization event (column 6, lines 62-65; column 7, lines 37-41).

As per claim 4, Cheng teaches the method of claim 1 wherein the first data path further comprises a last used data path associated with the storage device (column 6, lines 24-28; column 9, lines 37-62).

As per claim 5, Cheng teaches the method of claim 1 wherein the storage device further comprises a disk drive (column 5, lines 55-59).

As per claim 6, Cheng teaches the method of claim 5 wherein the disk drive is operatively interconnected with the computer by a Fibre Channel Arbitrated Loop (column 6, lines 34-65).

As per claim 7, Cheng teaches the method of claim 1 wherein the computer further comprises a file server (column 4, lines 24-34; column 5, lines 8-11).

As per claim 8, Cheng teaches the method of claim 1 wherein the set of data paths are described by a related set of data structures (column 5, lines 25-45; column 6, lines 15-21).

As per claim 9, Cheng teaches the method of claim 1 wherein the data paths utilize a Fibre Channel connection (column 6, lines 34-65).

As per claim 10, Cheng teaches a method for maintaining a set of data paths accessible by a set of upper level services of a storage operating system of a computer (column 4, lines 15-24), the method comprising the steps of: creating a device instance associated with a storage device (column 5, lines 25-45; column 6, lines 15-21); creating a first path instance associated with a first path to the storage device (column 2, lines 35-51); creating, in response to events

identifying an addition of a path, an additional path instance associated with an additional path to the storage device (column 5, lines 25-45; column 7, lines 23-26); and deleting, in response to events identifying a removal of a path, a path instance associated with the removed path (column 10, lines 15-20, wherein, disabling has the same functionality of deleting in this instance, in that, once a path instance is disabled, it is no longer used in the system).

As per claim 11, Cheng teaches the method of claim 10 wherein the step of creating a device instance occurs in response to receipt of an event identifying an addition of a storage device (column 7, lines 36-41).

As per claim 12, Cheng teaches the method of claim 10 wherein the events identifying an addition of a path is a Fibre Channel loop initialization event (column 6, lines 62-65; column 7, lines 37-41).

As per claim 13, Cheng teaches the method of claim 10 wherein the events identifying removal of a path is a Fibre Channel loop initialization event (column 6, lines 62-65; column 7, lines 37-41; column 10, lines 15-20).

As per claim 14, Cheng teaches the method of claim 10 wherein the step of creating an additional path instance further comprises the step of linking the additional path instance to a linked list of path instances associated with the storage device (column 5, lines 25-45).

As per claim 15, Cheng teaches the method of claim 10 wherein the device instance and path instances are accessible via an application program interface (column 5, lines 8-11).

As per claim 16, Cheng teaches the method of claim 10 wherein the set of upper level services further comprises a redundant array of inexpensive disks layer of the storage operating system (column 5, lines 55-59).

As per claim 17, Cheng teaches a computer for use with a plurality of storage devices having one or more data paths associated with the storage devices (column 4, lines 24-34), the computer comprising: means for detecting changes to the data paths associated with the storage devices (column 9, lines 11-15); means for maintaining a set of path instances associated with each of the plurality of storage devices, the data path instances accessible to a set of upper level services (column 5, lines 5-45); means for performing input/output operations to the plurality of storage devices using a first data path; means for selecting alternate data paths, in response to an error occurring with the first data path; and means for performing input/output operations to the plurality of storage devices using the selected alternate data paths (column 9, lines 11-15).

As per claim 18, Cheng teaches the computer of claim 17 wherein the upper level services access the data path instances via an application program interface (column 5, lines 8-11).

As per claim 19, Cheng teaches a storage operating system executing on a computer (column 4, lines 15-24), the storage operating system comprising: a routing administration layer, the routing administration layer dynamically updating a set of device instances, each device instance associated with a storage device (column 5, lines 25-45; column 9, lines 27-62); wherein each device instance includes at least one path instance, each path instance identifying a path from the computer to the associated storage device (column 5, lines 43-45); and a set of upper level services, the upper level services capable of accessing the device instances (column 5, lines 5-24).

As per claim 20, Cheng teaches the storage operating system of claim 19 wherein the routing administration layer further comprises an application program interface, the application

program interface providing the upper level services access to the set of device instances (column 5, lines 5-24; column 9, lines 27-35).

As per claim 21, Cheng teaches the storage operating system of claim 19 wherein the upper level services further comprises a redundant array of independent disks layer of the storage operating system (column 5, lines 55-59).

As per claim 22, Cheng teaches a computer-readable medium, including program instructions executing on a computer, for performing an input/output operation to a storage device having one or more data paths to the computer (column 4, lines 15-34), the program instructions including steps for: selecting a first data path from a linked list of data paths to the storage device (column 2, lines 35-51); attempting the input/output operation using the selected first data path; selecting, in response to an error in the input/output operation using the first data path, a next data path from the linked list of data paths; and attempting the input/output operation using the selected next data path (column 9, lines 11-15).

As per claim 23, Cheng teaches a computer-readable medium, including program instructions executing on a computer, for maintaining a set of data paths accessible by a set of upper level services of a storage operating system (column 4, lines 15-34), the program instructions including steps for: creating a device instance associated with a storage device (column 5, lines 25-45; column 6, lines 15-21); creating a first path instance associated with a first path to the storage device (column 2, lines 35-51); creating, in response to events identifying an addition of a path, an additional path instance associated with additional path to the storage device (column 5, lines 25-45; column 7, lines 23-26); and deleting, in response to events identifying a removal of a path, a path instance associated with the removed path (column 10, lines 15-20, wherein,

disabling has the same functionality of deleting in this instance, in that, once a path instance is disabled, it is no longer used in the system).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See attached PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. McCarthy whose telephone number is (571)272-3651. The examiner can normally be reached on M-F, 9 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (571)272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

csm
November 9, 2004

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